

ILC-Americas Workshop

Working Group 2 Organization

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WG1, 2 and 5 coordinators met at Jlab on Sept. 29, 2004 to discuss the charge, how we proceed, what are the issues.

WG2 coordinators have been talking to many of you, putting together a plan discussing issues and you are welcome to join the group.

This is the start of these discussions. We plan to continue these discussion through ILC-KEK workshop.

The workshop charge

- Initiate the work for the ILC (pre-GDI) after the technology choice of superconducting RF technology.
- Review the Technical Issues with SC-LC.
- Develop lists of design elements and decide whether they are
 - non-controversial in concept and may only need some optimization; or
 - should be considered open to reevaluation, in the conceptual design phase.
- Work according to the list above.
- Present the topics the different groups are interested in, and can contribute to the overall design

Working Group Discussion Topics

- Requirements for Emittance Preservation
 - Quad vibration
 - Quad to BPM alignment
 - Cavity alignment
 - Constraints on iris diameter
- Wakefields
 - Review of mode measurements and HOM Requirements
 - Are all relevant modes sufficiently damped.
 - Mode polarization and x-y beam motion coupling
- LLRF
 - Requirements
 - Comparison with XFEL, SNS, etc. requirements
 - Tests that could be preformed at TTF
- Modulators
 - Performance of current design
 - Other approaches
 - Industrialization

Working Group Discussion Topics

- Klystrons
 - Status of TESLA Tube Development
 - Industrialization
- RF Distribution
 - Waveguide Options
 - Layout Options
 - Tuner Options
- System Test
 - Requirements
 - Facilities (TTF, SMTF, Cornell, Jlab, SNS, KEK ...)
 - Measurements (Trip Rates, Dark Currents, Radiation ...)
 - Schedule
- Linac Technical and Cost Optimization

Working Group 2

- Accelerator Physics and Technology (WG1)
 - Low Emittance Transport
 - Effect and control of Wakefield
- RF Power Generation and Distribution
 - Modulator
 - Klystron
 - Waveguide
 - LLRF
- Cryomodule Issues (WG5)
- System Test and Optimization (US, DESY, KEK) (WG5)

ILC Parameters

Parameter	Unit	Reference design	Upgrade
Beam Energy	GeV	250	500
RF gradient	MV/m	28	35
Two-Linac total length ^a	km	27.00	42.54
Bunches/pulse		2820	2820
Electrons/bunch	10^{10}	2	2
Pulse/s	Hz	5	5
$\gamma\epsilon_x$ (IP)	$\mu\text{m-rad}$	9.6	9.6
$\gamma\epsilon_y$ (IP)	$\mu\text{m-rad}$	0.04	0.04
β_x (IP)	mm	15	24.4
β_y (IP)	mm	0.4	0.4
σ_x (IP)	nm	543	489
σ_y (IP)	nm	5.7	4.0
σ_z (IP)	mm	0.3	0.3
D_y		22.0	17.3
H_D ^b		1.77	1.68
\mathcal{L}	$10^{33}\text{cm}^{-2}\text{s}^{-1}$	25.6	38.1
N_γ		1.48	1.58
δ_E	%	3.0	5.9
Average power per beam	MW	11.3	22.6
Peak beam current during pulse	mA	9.51	9.51
Beam pulse length	μs	950	950
Q_{ext} (matched)	10^6	2.95	3.69
Cavity filling time	μs	501	626
External bandwidth (matched)	Hz	440	352
Total number of klystrons		603	1211
Peak beam power per klystron	MW	8.3	8.3
Total number of cavities		18096	29064
Peak beam power per cavity	kW	276	345
Total AC power for RF ^c	MW	87.3	184.3
Total AC power for cryogenics ^c	MW	21.3	73.7
Total AC power ^d	MW	108.6	258.0
Overall AC ^d to beam efficiency	%	20.8	17.5

Working Group 2 Agenda

Thursday 15:30 to 18:00

Beam Dynamics

Attend WG1 or WG5 Session

RF Power Generation

Chris A

Modulator

Ray Larsen 30

Howie Pfeffer 30

Dick Cassel 30

Kicker Joe Frisch 30

Discussion 30

Friday 9:00 to 10:45

Shekhar

Chris A

LET P. Tennenbaum 30

Nikolay Solyak 30

David Sagan 20

Discussion 25

RF Sources

George Caryotakis 45

Al Moretti 30

Sami Tantawi 15

Discussion 15

Friday 11:00 to 13:00

Beam Dynamics

Lia

Wakefields

Ricky Campisi	25
T. Khabiboulline	25
Roger Miller	25
Roger Jones	25
Discussion	20

RF Power Generation

Chris A

RF Dist

LLRF

Phase Ref.

Chris Nantista	30
Al Moretti	15
Larry Doolittle	30
Joe Frisch	15
Discussion	30

Friday 14:00 to 16:30

Cryomodule Issues, Linac Costs and System Tests Helen

Discussion with WG5	60
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System Test

Shekhar Mishra	30
Warren Funk	30

Linac Costs

John Cornuelle	30
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Friday 16:30 to 18:00

10/14/2004
Prepare Summary

ILC-Americas Workshop @ SLAC